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(54) Detergent dispensing in washing machines

(57) A more efficient dispensing of detergent products from the dispenser unit of a washing machine can be achieved by recirculation of water from the main vessel of the washing machine to the dispenser unit at a rate of not less than 5 litres per minute.

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IMPROVED DISPENSING OF DETERGENT PRODUCTS

The present invention relates to an improvement in the process of dispensing detergent products, whether liquid or powder, in a washing machine.

At present, the dispensing of detergent products, rinse conditioners etc. in a washing machine is effected by directing the incoming water from the domestic supply onto the product to be dispensed into the vessel wherein the washing process etc. takes place. To achieve efficient dispensing of product, various configurations of water inlet, drawer design, liquid dispensing compartment, syphon tubes etc. are currently utilised.

In any such dispensing process, the efficiency of transport of the relevant product into the main vessel is ultimately dependent upon the flow rate of water through the relevant compartment. In the not infrequent circumstances of the domestic water supply being at low pressure and/or low flow rate, dispensing is often not complete. This problem is familiar to those acquainted with the art.

The consequences of poor transport of the relevant product into the main vessel are poor delivery of the anticipated benefits had all the product been dispensed, and a clear indication to the user that dispensing was not complete.

We have observed, in laboratory tests, that increasing the flow rate will almost invariably lead to total dispensing of product in a wide variety of designs of dispenser unit.

The present invention relates to improving the flow

rate by water being directed through the dispenser unit using a circulation pump drawing liquor from the main vessel previously filled directly from the domestic water supply (via an anti-syphoning air break if required by the relevant water authority).

We have found typically, that, provided a flow rate of not less than about 5 litres per minute is generated by the recirculation pump, then good dispensing will be achieved in conventional dispenser units.

Naturally, the above process can be applied whenever product, whether liquid or powder, is to be transported into the main vessel.

In the case of a liquid product, which would normally be held in a liquid-retaining compartment, we have also found that the size and number of water jets in the spray head are critical. Specifically, we have found that jet diameters greater than 3 mm are required, ideally not less than 4 mm in order that sufficient momentum and penetration are achieved to disperse liquid detergents. The number of jets required is dependent on the size (area) of the liquid-retaining compartment but should be minimised to maintain the momentum of each individual jet. However, 3 or more jets will usually be required in order to ensure that the necessary turbulence is generated across the whole compartment. The high water flow rate required to meet the above requirements can readily be achieved by using a circulation pump as described.

In a further embodiment of the invention, the liquor can be pre-heated in the main vessel prior to recirculation as a further aid to dispensing. The recirculation may be either continuous or intermittent during the subsequent process, i.e. washing, fabric-conditioning or bleaching.

This improved process further increases the flexibility in design of dispenser units, which can be of especial value where a dispenser is designed to handle both powder and liquid products as alternatives. A further advantage is that mechanical loss of powdered detergent product is reduced since undissolved detergent product, when present in the water in the sump of the washing machine, is also recirculated.

The process is also applicable to dispensing fabric conditioner products, bleach products and the like.

CLAIMS

1. A process for dispensing of detergent products from a washing machine dispensing unit, characterised in that the products are dispensed from the dispenser unit by recirculation of water from the main vessel of the machine to the dispenser unit at a rate of not less than about 5 litres per minute by means of a recirculation pump.

2. A process according to claim 1, characterised in that the water is circulated through a spray head where not less than 2 jets each of not less than about 5 mm diameter are used to direct water on to the detergent product.

3. A process according to claim 1, characterised in that the water in the main vessel is pre-heated prior to commencement of recirculation.

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